

**Amendments to the Specification:**

Please replace the paragraph on page 1, lines 20-23 with the following amended paragraph:

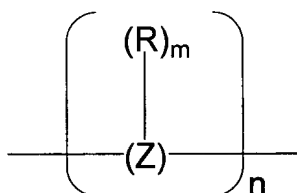
This application is a continuation of U.S. Patent Application Serial No. 08/195,866 filed February 11, 1994, now patent No. 6,075,012, which is incorporated by reference in its entirety herein to the extent not inconsistent herewith.

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claims 1-104 (cancelled)

105. (currently amended): A polyamino acid with the structure:



and salts thereof, where:

n is an integer ranging from 2 to about 2,000;

m is either 0 or 1, provided that m is 1 at least once in the compound and m is zero at least once in the compound, the termini of the polyamino acid are an NH<sub>2</sub> and a carboxyl group;

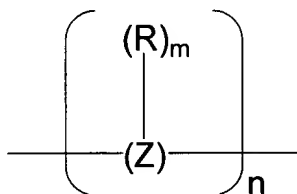
R is R<sub>A</sub> or R<sub>B</sub>, where R<sub>A</sub> is C<sub>1-23</sub> alkyl or alkenyl and R<sub>B</sub> is a steroid selected from the group consisting of stigmasterol, ergosterol and cholic acid; and

Z is a basic amino acid wherein Z groups are linked by Z—Z peptide bonds.

106. (previously presented): A compound according to claim 105 where Z is selected from the group of amino acids consisting of ornithine, lysine, arginine and histidine.

107. (previously presented): A compound according to claim 105 where Z is L-ornithine.

108. (currently amended): A polysaccharide with the structure:



and salts thereof where:

n is an integer ranging from 2 to about 2,000;

m is either 0 or 1, provided that m is 1 at least once in the compound and m is zero at least once in the compound;

R is R<sub>A</sub> or R<sub>B</sub>, where R<sub>A</sub> is an alkyl or alkenyl group having 12 to 22 carbon atoms and R<sub>B</sub> is a steroid selected from the group consisting of stigmasterol, ergosterol and cholic acid; and

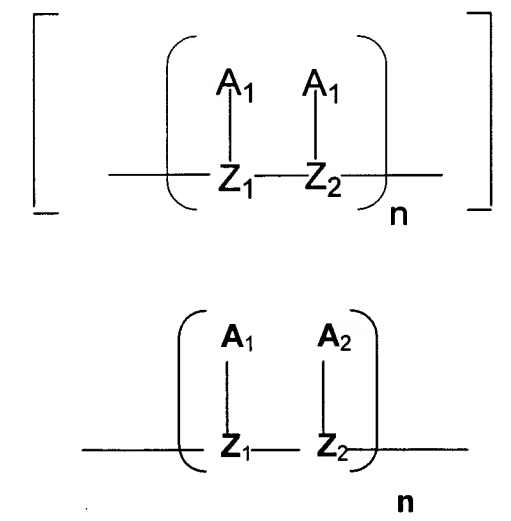
Z is a monosaccharide having from 3 to 7 carbon atoms wherein Z groups are linked by Z—Z glycosidic bonds, the termini of the polysaccharide dependent upon Z are H or OH.

109. (previously presented): A compound according to claim 108 where said monosaccharide comprises a cationic substituent.

110. (previously presented): A compound according to claim 109 where said cationic substituent is a tertiary amine.

111. (previously presented): A compound according to claim 109 where said cationic substituent is diethylaminoethyl.
112. (currently amended): A compound according to claim 109 where said monosaccharide is glucose and said cationic substituent is ~~diethylamioethyl~~ diethylaminoethyl.
113. (previously presented): A composition for transfecting a cell with a nucleic acid which comprises a nucleic acid and one or more compounds according to claim 105.
114. (previously presented): A lipid aggregate which comprises one or more compounds according to claim 105.
115. (previously presented): A method for transfecting a cell comprising the step of contacting the cell with a lipid aggregate comprising a nucleic acid and one or more compounds according to claim 105.
116. (previously presented): A composition for transfecting a cell with a nucleic acid which comprises one or more compounds according to claim 105 capable of complexing said nucleic acid to be transfected into said cell, and a transfection-enhancing agent selected from the group consisting of an enveloped virus, a membrane virus, a viral component, and a non-viral fusagenic compound.
117. (previously presented): A composition according to claim 116 wherein said transfection-enhancing agent is an enveloped virus, and wherein said enveloped virus is an alphavirus.
118. (previously presented): A composition according to claim 117 wherein said alphavirus is Semliki Forest virus.

119. (previously presented): A composition according to claim 116 wherein said transfection-enhancing agent is a viral component and wherein said viral component is selected from the group consisting of viral proteins, envelope fusion peptides, viral spike glycoproteins, viral peptides of viral spike glycoproteins, and viral envelope fragments containing embedded viral protein.
120. (previously presented): A composition according to claim 116 wherein said transfection-enhancing agent is a non-viral fusagenic peptide.
121. (previously presented): A method for transfecting a cell comprising the steps of contacting the cell with one or more transfecting compositions according to claim 116.
122. (previously presented): A transfection kit which comprises one or more compounds according to claim 105.
123. (previously presented): The transfection kit of claim 122 further comprising one or more of a viral agent, a component of an enveloped virus, or a non-viral fusagenic peptide.
124. (currently amended): A lipophilic polyamino acid of the formula:



and salts thereof,

where:

Z<sub>1</sub> and Z<sub>2</sub>, independently of one another, are both amino acids selected from the group consisting of ornithine, lysine, arginine and histidine;

n is an integer ranging from 1 to about 2,000;

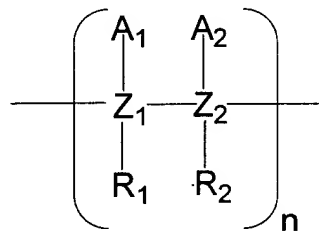
A<sub>1</sub> and A<sub>2</sub>, independently of one another, are selected from the group consisting of the groups X<sub>1</sub> - X<sub>4</sub> as follows:

- X<sub>1</sub> is a straight-chain alkyl, alkenyl, or alkynyl group having from 2 to about 22 carbon atoms wherein one or more non-neighboring -CH<sub>2</sub>- groups can be replaced with an O or S atom;
- X<sub>2</sub> is a branched alkyl, alkenyl, or alkynyl group having from 2 to about 22 carbon atoms wherein one or more non-neighboring -CH<sub>2</sub>- groups can be replaced with an O or S atom;
- X<sub>3</sub> is a straight-chain or branched alkyl group substituted with one or two OH, SH, NH<sub>2</sub> or amine groups within about 3 carbon atoms of the bond between X<sub>3</sub> and Z;
- X<sub>4</sub> is a substituted straight-chain or branched alkyl, alkenyl or alkynyl group having from 2 to about 22 carbon atoms wherein the substituent is an aromatic, alicyclic, heterocyclic or polycyclic ring and wherein one or more of the non-neighboring -CH<sub>2</sub>- groups of said alkyl, alkenyl or alkynyl group can be substituted with an O or S atom; and

the termini of the polyamino acid are an NH<sub>2</sub> and a OH.

125. (previously presented): The lipophilic polyamino acid of claim 124 wherein n is between 10 and 50.
126. (previously presented): The lipophilic polyamino acid of claim 124 wherein Z<sub>1</sub> and Z<sub>2</sub> are lysines.
127. (previously presented): The lipophilic polyamino acid of claim 124 wherein Z<sub>1</sub> and Z<sub>2</sub> are arginines.
128. (previously presented): The lipophilic polyamino acid of claim 124 wherein A<sub>1</sub> and A<sub>2</sub>, independently of one another, are a straight-chain or branched alkyl, alkenyl, or alkynyl group having from 2 to about 22 carbon atoms wherein one or more non-neighboring -CH<sub>2</sub>- groups can be replaced with an O or S atom.
129. (previously presented): The lipophilic polyamino acid of claim 128 wherein alkyl, alkenyl, or alkynyl groups have from about 12 to about 22 carbon atoms.
130. (previously presented): The lipophilic polyamino acid of claim 124 wherein the A<sub>1</sub> and A<sub>2</sub> groups are alkyl groups having from about 12 to about 22 carbon atoms.
131. (previously presented): The lipophilic polyamino acid of claim 124 wherein A<sub>1</sub> and A<sub>2</sub>, independently of one another, are straight-chain or branched alkyl groups substituted with one or two OH, SH, NH<sub>2</sub>, or amine groups within about 3 carbon atoms of the bond between X<sub>3</sub> and Z<sub>1</sub> and Z<sub>2</sub>.
132. (previously presented): The lipophilic polyamino acid of claim 124 wherein A<sub>1</sub> and A<sub>2</sub>, independently of one another, are substituted straight-chain or branched alkyl, alkenyl or alkynyl groups having from 2 to about 22 carbon atoms wherein the substituent is an aromatic alicyclic, heterocyclic or polycyclic ring and wherein one or more of the non-neighboring -CH<sub>2</sub>- groups of said alkyl, alkenyl or alkynyl group can be substituted with an O or S atom.

133. (previously presented): A composition for transfecting cells which comprises a nucleic acid and one or more lipophilic polyamino acids according to claim 124.
134. (previously presented): The composition of claim 133 wherein the A<sub>1</sub> and A<sub>2</sub> groups of said lipophilic polyamino acid are alkyl groups having from about 12 to about 22 carbon atoms.
135. (previously presented): A lipid aggregate comprising one or more lipophilic polyamino acids according to claim 124.
136. (previously presented): A method for transfecting a cell which comprises the step of contacting the composition of claim 133 with a cell.
137. (previously presented): A transfection kit which comprises one or more lipophilic polyamino acids according to claim 124.
138. (currently amended): A lipophilic polycationic polysaccharide of formula:



and salts thereof,

where:

Z<sub>1</sub> and Z<sub>2</sub>, independently of one another, are monosaccharides;

n is an integer ranging in value from 1 to about 600;

R<sub>1</sub> and R<sub>2</sub>, independently of one another, are tertiary amines; and

A<sub>1</sub> and A<sub>2</sub>, independently of one another, are selected from the group consisting of groups X<sub>1</sub> - X<sub>4</sub> as follows:



- X<sub>1</sub> is a straight-chain alkyl, alkenyl, or alkynyl group having from 2 to about 22 carbon atoms wherein one or more non-neighboring -CH<sub>2</sub>- groups can be replaced with an O or S atom;
- X<sub>2</sub> is a branched alkyl, alkenyl, or alkynyl group having from 2 to about 22 carbon atoms wherein one or more non-neighboring -CH<sub>2</sub>- groups can be replaced with an O or S atom;
- X<sub>3</sub> is a straight-chain or branched alkyl group substituted with one or two OH, SH, NH<sub>2</sub> or amine groups within about 3 carbon atoms of the bond between X<sub>3</sub> and Z<sub>1</sub> and Z<sub>2</sub>;
- X<sub>4</sub> is a substituted straight-chain or branched alkyl, alkenyl or alkynyl group having from 2 to about 22 carbon atoms wherein the substituent is an aromatic, alicyclic, heterocyclic or polycyclic ring and wherein one or more of the non-neighboring -CH<sub>2</sub>- groups of said alkyl, alkenyl or alkynyl group can be substituted with an O or S atom; and

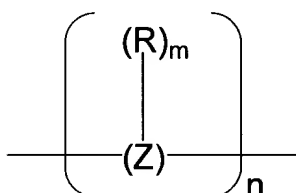
the termini of the polysaccharide are H or OH dependent upon the structures of ~~monosaccharides~~ monosaccharides Z<sub>1</sub> and Z<sub>2</sub>.

139. (previously presented): The polycationic polysaccharide of claim 138 wherein Z<sub>1</sub> and Z<sub>2</sub> are both glucose.
140. (previously presented): The polycationic polysaccharide of claim 138 wherein n is between 50 and 100.
141. (previously presented): The polycationic polysaccharide of claim 138 wherein R<sub>1</sub> and R<sub>2</sub> are diethylaminoethyl groups.

142. (previously presented): The polycationic polysaccharide of claim 138 wherein  $A_1$  and  $A_2$ , independently of one another, are a straight-chain or branched alkyl, alkenyl, or alkynyl group having from 2 to about 22 carbon atoms wherein one or more non-neighboring  $-CH_2-$  groups can be replaced with an O or S atom.
143. (previously presented): The polycationic polysaccharide of claim 138 wherein alkyl, alkenyl, or alkynyl groups have from about 12 to about 22 carbon atoms.
144. (previously presented): The polycationic polysaccharide of claim 138 wherein  $A_1$  and  $A_2$ , independently of one another, are straight-chain or branched alkyl groups substituted with one or two OH, SH,  $NH_2$  or amine groups within about 3 carbon atoms of the bond between  $X_3$  and  $Z_1$  and  $Z_2$ .
145. (previously presented): The polycationic polysaccharide of claim 138 wherein  $A_1$  and  $A_2$ , independently of one another, are substituted straight-chain or branched alkyl, alkenyl or alkynyl groups having from 2 to about 22 carbon atoms wherein the substituent is an aromatic, alicyclic, heterocyclic or polycyclic ring and wherein one or more of the non-neighboring  $-CH_2-$  groups of said alkyl, alkenyl or alkynyl group can be substituted with an O or S atom.
146. (previously presented): A composition for transfecting cells which comprises a nucleic acid and one or more polycationic polysaccharides according to claim 138.
147. (previously presented): The composition of claim 146 wherein the  $A_1$  and  $A_2$  groups of said polycationic polysaccharide are alkyl groups having from about 12 to about 22 carbon atoms.
148. (previously presented): A lipid aggregate comprising one or more polycationic polysaccharides according to claim 138.

149. (previously presented): A method for transfecting a cell which comprises the step of contacting the composition of claim 146 with a cell.
150. (previously presented): A transfection kit which comprises one or more polycationic polysaccharides of claim 138.
151. (previously presented): A composition for transfecting a cell with a nucleic acid which comprises a nucleic acid and one or more compounds according to claim 108.
152. (previously presented): A lipid aggregate which comprises one or more compounds according to claim 108.
153. (previously presented): A method for transfecting a cell comprising the step of contacting the cell with a lipid aggregate comprising a nucleic acid and one or more compounds according to claim 108.
154. (previously presented): A transfection kit which comprises one or more compounds according to claim 108.
155. (previously presented): A composition for transfecting a cell with a nucleic acid which comprises a compound of claim 161 capable of complexing said nucleic acid to be transfected into said cell, and one or more transfection-enhancing agents selected from the group consisting of an enveloped virus, a membrane virus, a viral component, and a non-viral fusagenic compound.
156. (previously presented): A composition according to claim 155 wherein said transfection-enhancing agent is an enveloped virus, and wherein said enveloped virus is an alphavirus.
157. (previously presented): A composition according to claim 155 wherein said alphavirus is Semliki Forest virus.

158. (previously presented): A composition according to claim 155 wherein said transfection-enhancing agent is a viral component and wherein said viral component is selected from the group consisting of viral proteins, envelope fusion peptides, viral spike glycoproteins, viral peptides of viral spike glycoproteins, and viral envelope fragments containing embedded viral protein.
159. (previously presented): A composition according to claim 155 wherein said transfection-enhancing agent is a non-viral fusagenic peptide.
160. (previously presented): A method for transfecting a cell comprising the step of contacting the cell with the transfecting composition of claim 155.
161. (currently amended): A polyamino acid with the structure:



and salts thereof, where:

n is an integer ranging from 2 to about 2,000;

m is either 0 or 1, provided that m is 1 at least once in the compound and m is zero at least once in the compound, the termini of the polyamino acid are an NH<sub>2</sub> and a OH;

R is R<sub>A</sub> or R<sub>B</sub>, where R<sub>A</sub> is C<sub>4-23</sub> an alkyl or alkenyl having from about 12 to about 22 carbon atoms and R<sub>B</sub> is a steroid selected from the group consisting of stigmasterol, ergosterol and cholic acid; and

Z is an amino acid wherein Z groups are linked by peptide bonds.